FOODOMICS:

The applications of proteomics and metabolomics in food technology

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AIMS

- Investigate the adaptation of new techniques
- Foodomics advantatges
- What applications do they have?
- What about these techniques in the future?

APPLICATIONS

1. <u>FOOD QUALITY</u>

Quality control in grape juice

- RMN + chemometric analysis
- Metabolites: ethanol and acetate

2. <u>FOOD SECURITY</u>

Deterioration of meat by *Salmonella Typhimurium*

- GC/MS with quadrupole filter + PCA
- Metabolites (COVs): phenethyl alcohol, 1-butanol, 3-methyl acetate, dimethyl disulfide, 2-heptanone and L-5-propylthio.

3. <u>TRACEABILITY</u>

Meat adulteration

- HPLC-MS/MS with Q orbitrap
- Proteins: troponin T and myosine

4. <u>TRANSGENICS</u>

Subtantial equivalence in GM soybeans

- CE-TOF-MS
- Proteins: glycine and conglycine B

TOOLS

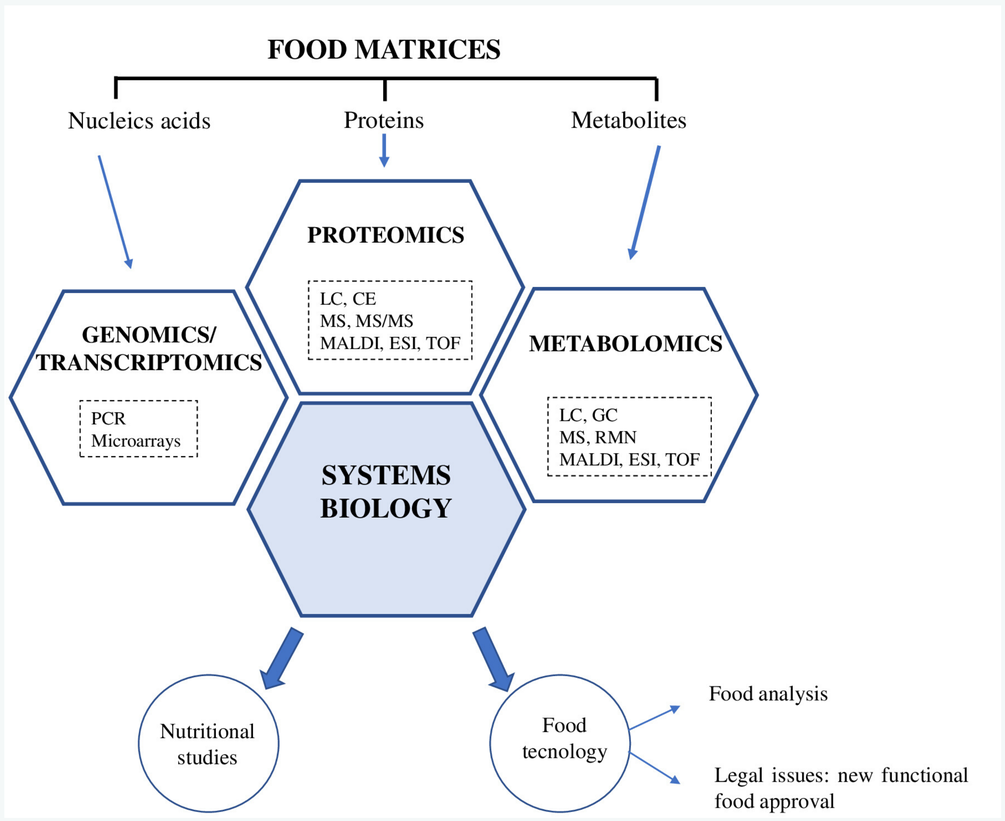

Figure 1: Foodomics strategy for investigating dietary components and approval of new functional foods, including analytical tools and methodologies based in (1).

CONCLUSIONS

- Foodomics has helped to solve some limitations of traditional food analysis
- The advantatges are:
  - Simultaneous analysis
  - Faster
  - Sensibility
  - Reproducibility
  - High resolution
- The applications are those mentioned, and every tool can be useful in everyone, however, some are more appropiate.
- Future:
  - Proteomics: proteins microarrays, lab chips and MALDI Biotyper.
  - Metabolomics: sophisticated software.

REFERENCE: (1) García-Cañas V, Simó C, Herrero M, Ibáñez E, Cifuentes A. Present and future challenges in food analysis: Foodomics. Anal Chem. 2012:10150–9.